

TCS previous placement questions - 25 (2016)

1. How many liters of a 90% of concentrated acid needs to be mixed with a 75% solution of concentrated acid to get a 30 liter solution of 78% concentrated acid?

- a. 3
- b. 4
- c. 6
- d. 10

Answer: c

Explanation:

Let n_1 liters of 90% concentration has to be mixed with n_2 liters of 75% concentration to get 78% concentration

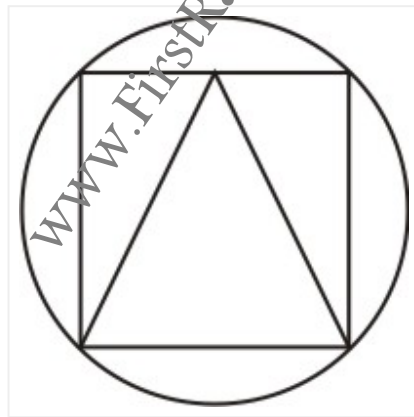
solution. Using weighted average formula $a_x = \frac{n_1 \times a_1 + n_2 \times a_2}{n_1 + n_2}$

$$78 = \frac{n_1 \times 90 + n_2 \times 75}{n_1 + n_2}$$

$$\frac{n_1}{n_2} = \frac{1}{4}$$

by dividing 30 in the ratio 1:4 we get 6 : 24. So we need 6 liters.

2. Find the ratio of the area of square to area of triangle.

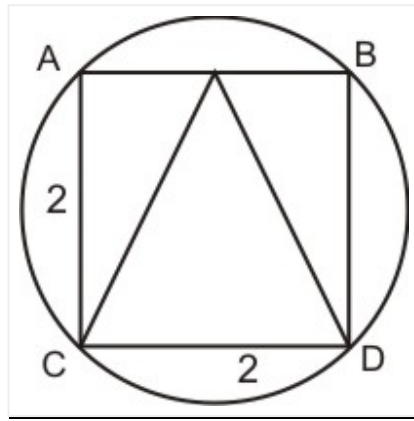


- a. 1:2
- b. 2:1
- c. 2:3
- d. 3:2

Answer: b

Explanation:

Have a look at the diagram below.



Let the side of the square = 2 units.

Now the area of the square = $2^2 = 4$.

Area of the triangle = $\frac{1}{2} \times 2 \times 2 = 2$

Ratio = $4 : 2 = 2 : 1$.

3. In this question A^B means A raised to the power B. If $f(x) = ax^4 - bx^2 + x + 5$ and $f(-3) = 2$, then $f(3) =$

- a. 1
- b. - 2
- c. 3
- d. 8

Answer: d

Explanation:

$$f(-3) = a(-3)^4 - b(-3)^2 + (-3) + 5 = 81a - 9b + 2 = 2 \text{ So } 81a - 9b = 0$$

$$f(3) = a(3)^4 - b(3)^2 + (3) + 5 = 81a - 9b + 8$$

Substituting the value of $81a - 9b = 0$ in the above we get $f(3) = 8$

4. Of a set of 30 numbers, average of first 10 numbers = average of last 20 numbers. Then the sum of the last 20 numbers is?

- a. Cannot be determined.
- b. 2 x sum of last ten numbers
- c. 2 x sum of first ten numbers
- d. sum of first ten numbers

Answer: c

Explanation:

We know that sum = average x number of observations.

Let the common average = x

Now sum of first 10 numbers = $10x$

Sum of the last 20 numbers = $20x$.

So sum of the last 20 numbers = $2 \times$ sum of the first ten numbers.

5. A play school has chocolates which can supply 50 students for 30 days. For the first ten days only 20 students were present. How many more students can be accommodated into the earlier group such that the entire chocolates get consumed in 30 days. Assume each student takes the same number of chocolates.

- a. 45
- b. 60
- c. 55
- d. 70

Answer: a

Explanation:

Let each student gets 1 chocolate. Now total chocolates = $50 \times 30 = 1500$

If first 10 days only 20 students were present, then total chocolates consumed = $10 \times 20 = 200$

Now we are left with $1500 - 200 = 1300$ chocolates. These were to be consumed in 20 days.

So each day $1300/20 = 65$ chocolates were to be distributed.

So we can add $65 - 20 = 45$ students.

6. In the town of Unevenville, it is a tradition to have the size of the front wheels of every cart different from that of the rear wheels. They also have special units to measure cart wheels which is called uneve. The circumference of the front wheel of a cart is 133 uneves and that of the back wheel is 190 uneves. What is the distance traveled by the cart in uneves, when the front wheel has done nine more revolutions than the rear wheel?

- a. 570
- b. 1330
- c. 3990
- d. 399

Answer: c

Explanation:

LCM of 133 and 190 is 1330. So to cover this distance, front wheel takes 10 rounds, and back wheel takes 7 rounds.

So for 3 rounds extra, 1330 uneves distance has to be travelled. To take 9 rounds extra, $1330 \times 3 = 3990$ uneves has to be traveled.

7. There are 20 persons sitting in a circle. In that there are 18 men and 2 sisters. How many arrangements are possible in which the two sisters are always separated by a man?

- a. $18! \times 2$
- b. $17!$
- c. $17 \times 2!$
- d. 12

Answer: a

Explanation:

Let the first sister name is A. Now she can sit anywhere in the 20 places (Symmetrical). Now her sister B can sit to her left or right in 2 ways. Now the remaining 18 persons can be sit in 18 places in $18!$ ways. Total = $18! \times 2$

8. A number plate can be formed with two alphabets followed by two digits, with no repetition. Then how many possible combinations can we get?

- a. 58500
- b. 67600
- c. 65000
- d. 64320

Answer: a

Explanation:

Easy. $26 \times 25 \times 10 \times 9 = 58500$

9. A alone can do $\frac{1}{4}$ th of the work in 2 days. B alone can do $\frac{2}{3}$ th of the work in 4 days. If all the three work together, they can complete it in 3 days so what part of the work will be completed by C in 2 days?

- a. $\frac{1}{12}$
c. $\frac{1}{16}$

- b. $\frac{1}{8}$
d. $\frac{1}{20}$

Answer: a

Explanation:

A can do the total work in 8 days, and B can do it in 6 days.

Let the total work be 24 units. Now capacities are

$$A = 24/8 = 3,$$

$$B = 24/6 = 4,$$

$$A + B + C = 24/3 = 8$$

So Capacity of C = 1 unit.

In two days C will do 2 units which is $\frac{2}{24}$ th part of the total work. So $\frac{1}{12}$ th part.

10. How many prime numbers are there which are less than 100 and greater than 3 such that they are of the following forms

- $4x + 1$
- $5y - 1$

- a. 11
c. 7

- b. 12
d. None of the above

Answer: d

Explanation:

Let the number be N.

$$\text{So } N = 4x + 1 = 5y - 1$$

$$\Rightarrow x = \frac{5y - 2}{4}$$

y = 2 satisfies the equation. So minimum number satisfies both the equations is 9 and general format of the numbers which satisfies the equation = k. $\text{LCM}(4, 5) + 9 = 20k + 9$.

Now by putting values 1, 2, 3 . . . for k, we get 29, 49, 69, 89. Of which only 29, 89 are primes.

11. Babla alone can do a piece of work in 10 days. Ashu alone can do it in 15 days. The total wages for the work is Rs.5000. How much should be Babla be paid if they work together for an entire duration of work.

- a. 2000
c. 5000

- b. 4000
d. 3000

Answer: d

Explanation:

Money should always be divided in the inversely proportion way. So Babla will get $\frac{15}{15+10} \times 5000 = 3000$

12. The shopkeeper charged 12 rupees for a bunch of chocolate. but i bargained to shopkeeper and got two extra ones, and that made them cost one rupee for dozen less then first asking price. How many chocolates I received in 12 rupees ?

- a. 10
c. 14

- b. 16
d. 18

Answer: b

Explanation:

Let the number of chocolates bought = n or n/12 dozens

Assume this would cost x rupees.

Now given that (n+2)/12 dozens cost x - 1 rupee.

$$\text{So } \frac{12}{n/12} = x \quad \text{--- (1)}$$

$$\text{and } \frac{12}{(n+2)/12} = x - 1 \quad \text{--- (2)}$$

$$(1) - (2) = \frac{144}{n} - \frac{144}{n+2} = 1$$

From the options, 16 satisfies.

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